

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A multimode optical transmission system for converting inputted electrical signals into optical signals, and performing multimode optical transmissions transmission of the optical signals, the multimode optical transmission system comprising:

a plurality of light sources for respectively converting the a plurality of electrical signals into a plurality of optical signals respectively having different wavelengths corresponding to the plurality of electrical signals, and respectively outputting the plurality of optical signals;

a wavelength multiplexing section for performing wavelength-multiplexing of the the plurality of optical signals outputted from the plurality of light sources, and outputting a resultant signal as a wavelength multiplexed signal;

a multimode optical transmission path for optically transmitting, in multimode, the wavelength multiplexed signal outputted from the wavelength multiplexing section;

a plurality of optical signal extraction sections for respectively extracting, from the wavelength multiplexed signal transmitted on the multimode optical transmission path, a plurality of optical signals, corresponding to the plurality of optical signal extraction sections, wherein each of the plurality of optical signals has a mode with a particular wavelength each having a mode having a particular wavelength and a particular propagation constant; and

a plurality of optical receiving sections for respectively receiving the plurality of optical signals extracted by the plurality of optical signal extraction sections and, and respectively converting the received plurality of optical signals into a corresponding plurality of electrical signals, wherein

the wavelengths a wavelength of each of the plurality of optical signals outputted from the plurality of light sources are set, is set such that a propagation constant of a fundamental mode of an optical signal, having a particular wavelength, outputted from each of the plurality of light

sources and is different from a propagation constant of a high order mode of an optical signal,
having a different wavelength, outputted from any other of the plurality of light sources are
different from each other.

2. (Currently Amended) The multimode optical transmission system according to claim 1, wherein the plurality of optical signal extraction sections each includecomprise:
an optical reflection section for reflecting ~~a corresponding one of the~~ the plurality of optical signals each having the mode with having the particular wavelength and the particular propagation constant for reflection, and
a reflected optical signal extraction section for extracting the optical signal reflected by the optical reflection section.

3. (Currently Amended) The multimode optical transmission system according to claim 1, wherein the plurality of optical signal extraction sections each includecomprise:
a plurality of optical reflection sections, corresponding to the plurality of optical signals, for respectively reflecting the plurality of optical signals, with each of the plurality of optical signals having a mode with each having a mode having a particular wavelength and a particular propagation constant for reflection by the optical reflection section corresponding to the optical signal,
a plurality of reflected optical signal extraction sections, corresponding to the plurality of optical reflection sections, for respectively extracting the optical signals reflected by the plurality of optical reflection sections,
a plurality of optical delay sections, corresponding to the plurality of reflected optical signal extraction sections, for respectively adding appropriate delays to the optical signals extracted by the plurality of reflected optical signal extraction sections, and
a multiplexing section for multiplexing the optical signals respectively outputted via the

plurality of optical delay sections.

4. (Currently Amended) The multimode optical transmission system according to claim 1, wherein each of the plurality of optical signal extraction sections each areis an optical filter for transmitting a corresponding one of the plurality of optical signals each having the mode having with the particular wavelength and the particular propagation constant for transmission, and and reflecting any other optical signals.

5. (Currently Amended) The multimode optical transmission system according to claim 1, wherein the plurality of optical signal extraction sections each includecomprise:

a plurality of optical filters, corresponding to the plurality of optical signals, for respectively transmitting the plurality of optical signals, with each of the plurality of optical signals having a mode with each having a mode having a particular wavelength and a particular propagation constant for transmission through the optical filter corresponding to the optical signal, and reflecting any other optical signals,

a plurality of optical delay sections, corresponding to the plurality of optical filters, for respectively adding appropriate delays to the optical signals transmitted through the plurality of optical filters, and

a multiplexing section for multiplexing the optical signals respectively outputted via the plurality of optical delay sections.

6. (Previously Presented) The multimode optical transmission system according to claim 1, wherein the multimode optical transmission path is a multimode optical fiber.

7. (Previously Presented) The multimode optical transmission system according to claim 1, wherein

the multimode optical transmission path is a single mode optical fiber, and a wavelength of an optical signal propagating through the single mode optical fiber is smaller than a cutoff frequency of the single mode optical fiber.

8. (Previously Presented) The multimode optical transmission system according to claim 1, wherein the multimode optical transmission path is a free space having a plurality of transmission paths.

9. (Previously Presented) The multimode optical transmission system according to claim 2, wherein the optical reflection section is a Fiber Bragg Grating.

10. (Currently Amended) The multimode optical transmission system according to claim 2, wherein the optical reflection section is an optical filter for transmitting a corresponding one of the plurality of optical signals each-having the mode with having the particular wavelength and the particular propagation constant for transmission and, and reflecting any other optical signals.

11. (Previously Presented) The multimode optical transmission system according to claim 2, wherein the reflected optical signal extraction section is an optical circulator.

12. (Previously Presented) The multimode optical transmission system according to claim 2, wherein the reflected optical signal extraction section is a photocoupler.

13. (Currently Amended) The multimode optical transmission system according to claim 3, wherein the plurality of optical delay sections each-are a plurality of optical waveguides.

14. (Original) The multimode optical transmission system according to claim 3, wherein the plurality of optical delay sections each adjust a delay amount by changing a refractive index of an optical transmission path.

15. (Original) A multimode optical transmission method for converting inputted electrical signals into optical signals, and performing multimode optical transmissions of the optical signals, the multimode optical transmission method comprising:

a light outputting step of, ~~by using a plurality of light sources,~~ converting ~~the~~ a plurality of electrical signals into a plurality of optical signals ~~respectively~~ having different wavelengths corresponding to the plurality of electrical signals, and outputting the plurality of optical signals;

a wavelength multiplexing step of ~~performing wavelength-multiplexing of the~~ the plurality of optical signals outputted ~~at the~~ in the light outputting step, ~~and~~ and outputting a resultant signal as a wavelength multiplexed signal;

an optical transmission step of, ~~via a multimode optical transmission path,~~ optically transmitting, in multimode via a multimode optical transmission path, the wavelength multiplexed signal outputted ~~at the~~ in the wavelength multiplexing step;

an optical signal extracting step of extracting, from the wavelength multiplexed signal transmitted via the multimode optical transmission path, a plurality of optical signals, wherein each of the plurality of optical signals has a mode with a particular wavelength ~~each having a plurality of modes each having a particular wavelength~~ and a particular propagation constant; and

a light receiving step of receiving the plurality of optical signals extracted ~~at the~~ in the optical signal extracting step, ~~and~~ and converting the received plurality of optical signals into a corresponding plurality of electrical signals, wherein

~~the wavelength~~ a wavelength of each of the plurality of optical signals outputted ~~at the~~ in the light outputting step are set, such is set such that a propagation constant of a fundamental mode of an optical signal, having a particular wavelength, outputted from each of the plurality of

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light sources and is different from a propagation constant of a high order mode of an optical signal, having a different wavelength, outputted from any other of the plurality of light sources are different from each other.